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# Estimating the Quantity of Settled Corn Silage in a Silo

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## INTRODUCTION

On farms where corn silage is made and fed, it is often desirable to know (1) the total tonnage of corn siloed, (2) the tonnage of settled silage available for feeding, and (3) the tonnage of settled silage removed from or still remaining in a silo that has been partly emptied.

In 1897 King[1] published a table of silo capacities based on the weight of the green corn at the time it was put in the silo and the depth of the silage after 2 days' settling. Twenty years later Chase[2] prepared a table of silo capacities based on the weight of the green corn and the depth at the time filling was completed. Chase's figures are lower than King's, which is due in part no doubt to the low moisture content of the corn he put in some of the silos. Apparently both investigators depended upon mathematical calculations to determine the weight of silage at different depths rather than upon actually weighing the silage. Neither worked with fully settled silage and neither took into account the losses in weight that occur through fermentation.

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[1] King, F. H. THE CONSTRUCTION OF SILOS AND THE MAKING AND HANDLING OF SILAGE. Wis. Agr. Expt. Sta. Bul. 59, 31 pp., illus. 1897.

[2] Chase, L. W. MEASURING SILAGE AND CAPACITY OF SILOS. Nebr. Agr. Expt. Sta. Cir. 1, 14 pp., illus. 1917.

Eckles, Reed, and Fitch [3] removed and weighed cubic foot samples of silage from different levels in silos. Most of this silage had a moisture content somewhat below the average, that is, if the figures for dry matter (27 or 28 percent) given by Morrison [4] are taken as the average. Since low-moisture silage weighs less than high-moisture silage, the data of these investigators led them to assign weights that are too low for average silage.

During several seasons of making and feeding silage the authors conducted an investigation at the Beltsville Research Center, Beltsville, Md., to determine more accurately the effect of depth on the weight of a cubic foot of silage. The investigation differed from the work of others mainly in that all the silage was weighed as it was removed from the silos and that records were kept showing the eared condition of the corn siloed, the lengths into which it was cut for silage, and the extent of tramping in the silo.

Data were obtained showing the total weight of the green corn that was put in eight silos, the total weight of silage removed from six of the eight silos, and the weight per cubic foot of silage at different depths in five of the silos. All the silos were approximately 14 feet in diameter, but they varied from 42 to 45 feet in height from floor to plate.

## MATERIALS USED AND THE METHOD OF INVESTIGATION

### The Corn Used

A medium-late variety of dent corn is grown for silage at Beltsville. Normally this corn is well eared; and most of it is siloed when the ears are slightly dented to well dented, but before they are fully dented and hard. At this stage the corn usually contains from 26 to 30 percent of dry matter (74 to 70 percent of moisture) and the stalks and leaves are still green and have a high carotene content.

In the eight silos used for this investigation, all the corn was well eared except that in silos 7 and 8, which was only fair in ears. All the corn was slightly dented to well dented, except that put in silo 4 (which was just beginning to dent) and in silo 2 (which was almost fully dented and hard).

### Filling the Silos

The silos were filled at the rate of 25 to 40 tons daily, the corn being weighed as it was hauled to the silage cutter. All corn was cut in ¼-inch lengths except that put in silo 3, which was cut in ¾-inch lengths. A jointed pipe distributor was used in all the silos, and one additional man tramped the corn throughout the silo-filling operation in all silos except 6 and 8. In silos 6 and 8 this additional man tramped the corn near the top of the silo only. The silos were refilled once on the following day. In each silo, the top was tramped thoroughly on the day following refilling, again 2 days later, and then at about weekly intervals until the silage was well settled.

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[3] Eckles, C. H., Reed, O. E., and Fitch, J. B. CAPACITIES OF SILOS AND WEIGHTS OF SILAGE. Mo. Agr. Expt. Sta. Bul. 164, 24 pp., illus. 1919.

[4] Morrison, F. B. FEEDS AND FEEDING; A HANDBOOK FOR THE STUDENT AND STOCKMAN. Ed. 20, unabridged, 1050 pp., illus. Ithaca, N. Y. 1936.

### WEIGHING OUT THE SILAGE

The silos were opened after storage periods ranging from 28 to 556 days. All of the silage in six silos was weighed as it was fed out. In five of these silos, the silage was removed by sections that averaged about 2 feet in depth. The silage in each section was taken out to a uniform level and the top of the next section was smoothed off by using a straight edge and spirit level, and the total quantity in the 2-foot section was determined. This procedure was repeated, each 2 feet down until the bottom was reached, to determine the weight per cubic foot at different depths in the silo.

## DISCUSSION OF THE RESULTS

### AVERAGE WEIGHT AND DRY-MATTER CONTENT PER CUBIC FOOT OF THE FRESHLY SILOED CORN

Table 1 shows the depth, weight, and dry-matter content of the freshly siloed corn in each of the eight silos, and the averages for all.

TABLE 1.—*Average weight of green corn and of dry matter per cubic foot at the time filling was completed*

| Silo No.[1] | Length of cut | Depth of corn in silo | Weight of corn siloed | Dry matter in corn | Average weight of green corn per cubic foot | | | | Dry matter per cubic foot |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Beltsville data | Chase's data [2] | Increase over Chase's data | | |
| | *Inch* | *Feet* | *Tons* | *Percent* | *Pounds* | *Pounds* | *Pounds* | *Percent* | *Pounds* |
| 1 | ¼ | 40.9 | 150.1 | 28.62 | 48.1 | 39.2 | 8.9 | 22.7 | 13.75 |
| 2 | ¼ | 42.8 | 149.8 | 31.58 | 44.8 | 40.0 | 4.8 | 12.0 | 14.16 |
| 3 | ¾ | 41.1 | 143.2 | 26.64 | 45.4 | 39.3 | 6.1 | 15.5 | 12.10 |
| 4 | ¼ | 41.1 | 160.1 | 25.58 | 50.7 | 39.3 | 11.4 | 29.0 | 12.97 |
| 5 | ¼ | 43.7 | 151.2 | 29.77 | 44.5 | 40.3 | 4.2 | 10.4 | 13.26 |
| 6 | ¼ | 41.7 | 141.2 | 26.70 | 44.3 | 39.5 | 4.8 | 12.2 | 11.83 |
| 7 | ¼ | 44.7 | 149.6 | 27.85 | 43.1 | 40.6 | 2.5 | 6.2 | 12.04 |
| 8 | ¼ | 43.2 | 140.6 | 27.78 | 42.6 | 40.1 | 2.5 | 6.2 | 11.83 |
| Average | | 42.4 | 148.2 | 28.08 | 45.4 | 39.8 | 5.6 | 14.1 | 12.74 |

[1] Silos 1, 2, 3, 4, 5, and 6 were filled with well-eared corn, silos 7 and 8 with corn that was only fair in ears. The corn put in silo 2 was fully dented and slightly too mature, and that put in silo 4 was just beginning to dent and was slightly immature. The corn in silos 6 and 8 was tramped near the top only.

[2] See text footnote 2, p. 1.

Both the total weight of the corn that was put in these silos and the weight per cubic foot was affected by the amount of ears in the corn, the percentage of moisture or of dry matter, the length of cut, and the amount of tramping during the filling operation. The weight of dry matter per cubic foot varied not only with the weight of the corn but also with the amount of moisture it contained.

Corn that was only fair in ears (silos 7 and 8) weighed 7.5 percent less per cubic foot than well-eared corn (silos 1 to 6). Corn with 74.42 percent of moisture (silo 4) weighed 13 percent more per cubic foot, but contained 8.4 percent less dry matter than corn with 68.42 percent of moisture (silo 2). Corn cut in ¾-inch lengths (silo 3) weighed 7.8 percent less than similar corn cut in ¼-inch lengths (silos 1 and 4). Corn that was tramped only at the top weighed 1.1 to 10.3 percent less per cubic foot than similar corn that was tramped throughout the silo-filling operation (compare silo 7 with silo 8; also silo 6 with silos 1 and 4).

On the average a cubic foot of the freshly siloed corn weighed 45.4 pounds, which is 5.6 pounds (14.1 percent) heavier than Chase's[5] weight of 39.8 pounds for the same depth of corn. It is also slightly heavier than the weight obtained by projecting King's curve[6] of weights to this depth. It is practically the same as the weights based on recent Beltsville data that were used by McCalmont[7] in estimating silo capacities.

## AVERAGE WEIGHT AND DRY-MATTER CONTENT OF THE SETTLED SILAGE

Table 2 shows the depth, weight, and dry-matter content of the settled silage in six silos.

TABLE 2.—*Average weight of settled silage and of dry matter per cubic foot at the time the silage was removed*

| Silo No. | Length of cut | Days from filling to opening of silo | Extent of settling | Depth of settled silage | Total weight of silage[1] | Weight of top spoilage | Dry-matter content of silage | Average weight per cubic foot | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Silage | Dry matter |
| | *Inch* | *Number* | *Feet* | *Feet* | *Tons* | *Pounds* | *Percent* | *Pounds* | *Pounds* |
| 1 | ¼ | 277 | 5.12 | 35.8 | 131.3 | 4,773 | 29.97 | 48.6 | 14.55 |
| 2 | ¼ | 28 | 3.83 | 39.0 | 136.6 | 2,180 | 32.00 | 45.0 | 14.41 |
| 3 | ¾ | 289 | 9.04 | 32.0 | 115.1 | 5,550 | 25.31 | 47.8 | 12.11 |
| 4 | ¼ | 556 | 9.45 | 31.6 | 122.4 | 5,760 | 24.87 | 51.0 | 12.68 |
| 5 | ¼ | 63 | 6.90 | 36.8 | 138.2 | 3,119 | 29.07 | 48.3 | 14.05 |
| 6 | ¼ | 148 | 8.09 | 33.6 | 122.8 | 4,650 | 26.17 | 47.8 | 12.50 |
| Average | -------- | -------- | -------- | 34.8 | 127.7 | -------- | 27.89 | 48.1 | 13.37 |

[1] Includes top spoilage, which varied from 8 to 18 inches in depth.

The distance settled and the loss in weight during storage depended largely on the length of the storage period. An increase in the storage period beyond 30 days apparently did not result in any increase in the weight of the silage per cubic foot.

The silage in all six silos was made from well-eared corn. Silage with 75.13 percent of moisture, made from corn just beginning to dent (silo 4), weighed 5 percent more per cubic foot, but contained 12.9 percent less dry matter than silage with 70.03 percent of moisture made from well-dented corn (silo 1). Silage with 68.00 percent of moisture, made from corn which was almost fully dented (silo 2), weighed 7.41 percent less per cubic foot and contained no more dry matter than well-dented corn with 70.03 percent of moisture (silo 1).

Silage cut in ¾-inch lengths (silo 3) weighed 6.3 percent less per cubic foot than silage with about the same dry-matter content cut in ¼-inch lengths (silo 4).

Silage with 26.17 percent of dry matter (silo 6) which was tramped only near and at the top, weighed 1.6 percent and 6.3 percent less per cubic foot, respectively, than silages with 29.97 and 24.87 percent of dry matter that were tramped throughout the silo-filling operation (silos 1 and 4).

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[5] See footnote 2, p. 1.

[6] See footnote 1, p. 1.

[7] McCALMONT, J. R. SILO TYPES AND CONSTRUCTION. U. S. Dept. Agr. Farmers' Bul. 1820, 62 pp., illus. 1939.

## WEIGHT AND DRY-MATTER CONTENT OF THE SETTLED SILAGE AT DIFFERENT DEPTHS

The weight and dry-matter content per cubic foot of the settled silage at different depths in five silos is shown in figure 1.

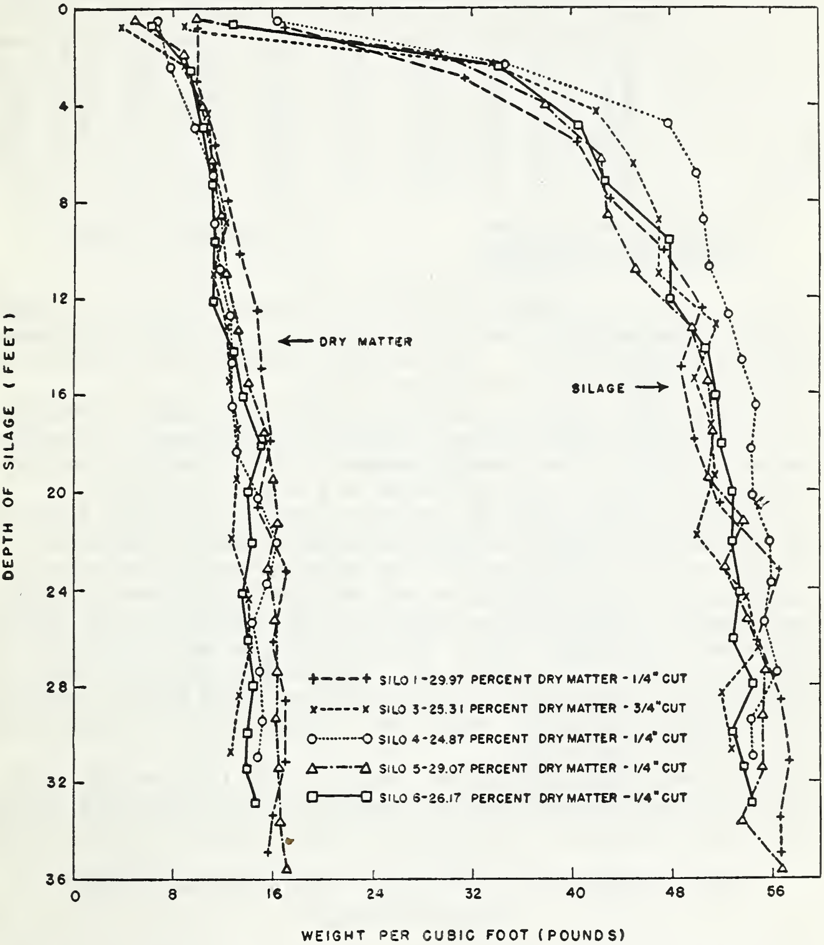

FIGURE 1.—Average weight and dry-matter content of a cubic foot of settled corn silage at the depth indicated.

In order to eliminate variations in weights between the 2-foot sections due to experimental error and to differences in moisture content, the data shown in figure 1 were smoothed out for each silo individually. The weight of a cubic foot of silage, and of its dry-matter content, at different depths on this corrected basis is given in table 3.

Both the original data and the smoothed data show that, except for one silo containing immature corn (silo 4), the trend toward an increase in weight with each increase in depth is similar for all the silos, with only small differences between silos at any given depth.

TABLE 3.—*Average weight of settled silage and of dry matter per cubic foot in different silos at the depth indicated*

| Depth from top of the settled silage (feet) | Silo 1 | | Silo 3 | | Silo 4 | | Silo 5 | | Silo 6 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Corn silage [1] | Dry matter | Corn silage [2] | Dry matter | Corn silage [3] | Dry matter | Corn silage [4] | Dry matter | Corn silage [5] | Dry matter |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| 1 | 18.8 | 5.63 | 15.9 | 4.02 | 21.2 | 5.27 | 18.0 | 5.23 | 18.2 | 4.76 |
| 3 | 31.4 | 9.41 | 37.0 | 9.36 | 38.0 | 9.45 | 32.8 | 9.53 | 34.2 | 8.95 |
| 5 | 38.2 | 11.45 | 42.3 | 10.71 | 45.4 | 11.29 | 38.7 | 11.25 | 40.0 | 10.47 |
| 10 | 46.5 | 13.94 | 48.1 | 12.17 | 51.7 | 12.86 | 46.3 | 13.45 | 47.4 | 12.40 |
| 15 | 50.4 | 15.10 | 50.4 | 12.76 | 54.0 | 13.43 | 50.2 | 14.59 | 50.9 | 13.32 |
| 20 | 53.0 | 15.88 | 51.8 | 13.11 | 55.0 | 13.68 | 52.4 | 15.23 | 52.5 | 13.74 |
| 25 | 55.0 | 16.48 | 52.8 | 13.36 | 55.5 | 13.80 | 53.7 | 15.61 | 53.2 | 13.92 |
| 30 | 56.2 | 16.84 | 53.3 | 13.50 | 55.7 | 13.87 | 54.5 | 15.84 | 53.7 | 14.05 |
| 35 | 56.8 | 17.02 | 53.6 | 13.57 | 56.0 | 13.93 | 54.8 | 15.92 | 54.0 | 14.13 |

[1] Dry-matter content, 29.97 percent.
[2] Dry-matter content, 25.31 percent.
[3] Dry-matter content, 24.87 percent.
[4] Dry-matter content, 29.07 percent.
[5] Dry-matter content, 26.17 percent.

The weight of the silage per cubic foot increased rapidly to a depth of about 5 feet and then more slowly and at a gradually diminishing rate to a depth of 35 feet. The data also indicate there is little or no increase in weight below this depth in silos.

At a depth of 1 foot the weight of a cubic foot of silage varied from 16 to 21 pounds; and at 35 feet, from 53.6 to 56.8 pounds. The dry-matter content per cubic foot at a depth of 1 foot varied from 4.0 to 5.6 pounds and from 14 to 17 pounds at a depth of 35 feet.

The effect of differences in moisture content and length of cut on the weight of corn silage at different depths is shown in figure 2.

Silage with 24.87 percent of dry matter, made from corn just beginning to dent, weighed more per cubic foot at different depths in the upper part of the silo than silage with 29.97 percent of dry matter made from well-dented corn, but in the lower part of the silo it weighed no more. (See fig. 2, *A*.) This lack of increased weight at the bottom for the immature silage may have been due to a pressing out of surplus moisture, which was indicated by a considerable seepage over a long period.

Cutting the corn into ¾-inch lengths reduced the weight of the settled silage per cubic foot at all depths in the silo below that of corn with similar dry-matter content cut in ¼-inch lengths. (See fig. 2, *B*.)

## BELTSVILLE DATA COMPARED WITH DATA OF OTHER INVESTIGATORS

From a study of the Beltsville data, it was concluded that the average data for four silos that contained silage made from well-eared corn that was cut when slightly dented to well dented, with an average dry-matter content of 27.63 percent, would provide a suitable basis for estimating the quantity of average silage in the silo after settling 30 days or more.

Table 4 shows the average weight of settled silage per cubic foot at given depths, also the average weight per cubic foot from the top to each depth, for these four silos, compared with similar data of Eckles, Reed, and Fitch.[8]

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[8] See footnote 3, p. 2.

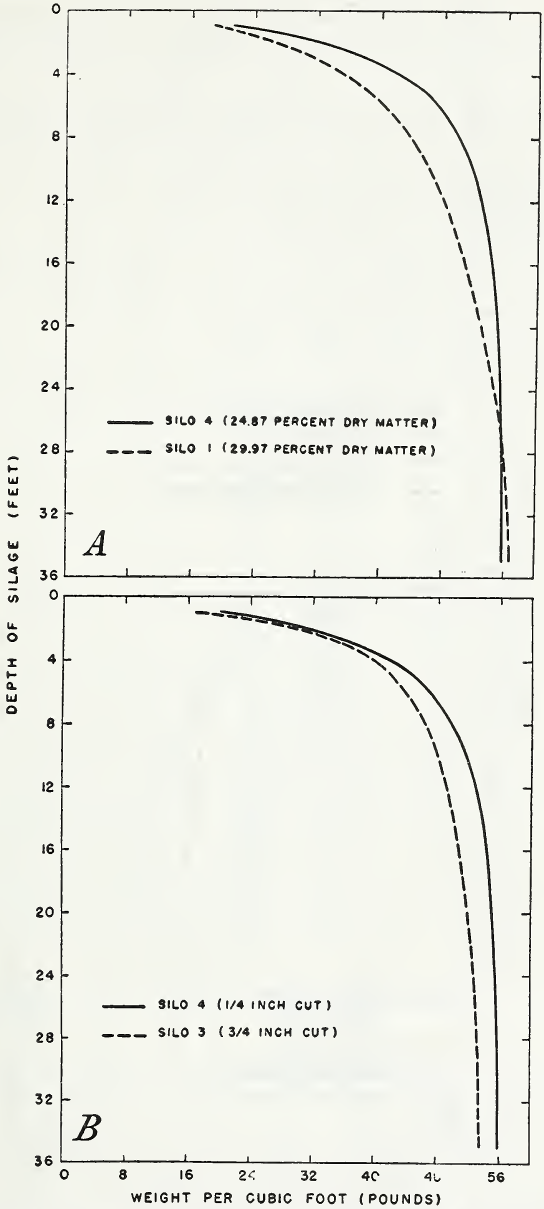

FIGURE 2.—Effect of differences in dry-matter content (*A*) and length of cut (*B*) on the weight of a cubic foot of settled corn silage at various depths.

Figure 3 illustrates the differences in weight per cubic foot between the Beltsville average for the four silos and the Eckles average, and shows also Chase's data[9] on the weight per cubic foot of freshly siloed corn and King's data[10] for corn that had settled 2 days.

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[9] See footnote 2, p. 1.

[10] See footnote 1, p. 1.

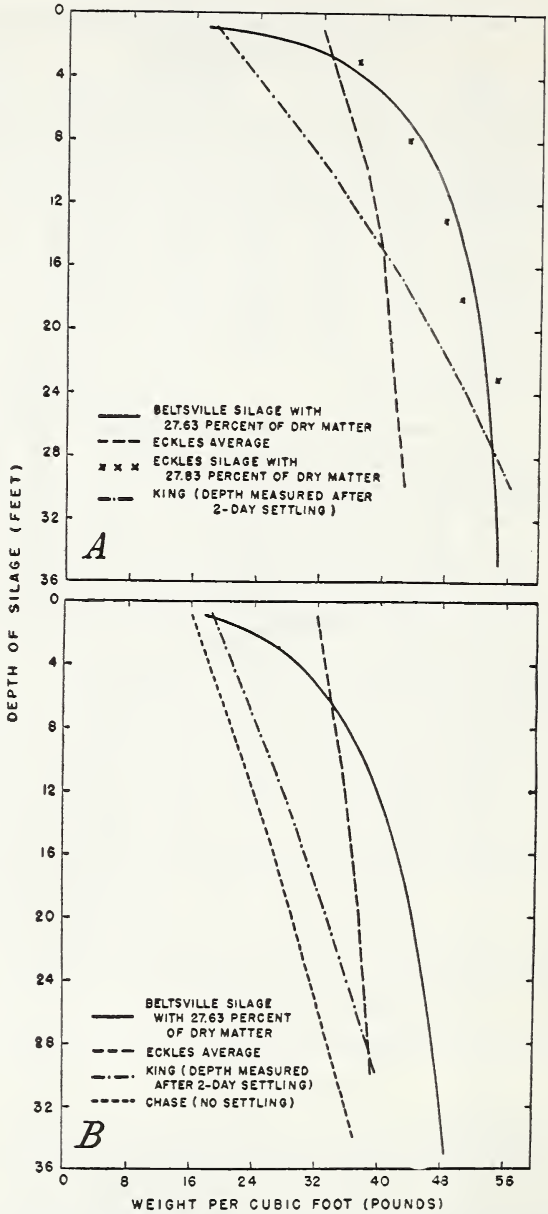

FIGURE 3.—Beltsville weights for settled corn silage compared with data from other investigators: *A*, Weight per cubic foot of silage at the depth indicated; *B*, average weight per cubic foot for all silage above the depth indicated.

The Eckles data did not include top spoilage. The weights per cubic foot are therefore higher for the top 3 feet than the Beltsville weights, while the Beltsville weights are higher below this depth.

At a depth of 30 feet from the top, the Beltsville silage weighed 54.4 pounds per cubic foot, or 26.5 percent more, than the Eckles silage. From the top of the silage to a depth of 30 feet, the Beltsville silage averaged 47.4 pounds per cubic foot as compared with 39.0 pounds for the Eckles silage, or nearly 22 percent more.

TABLE 4.—*Average weight of settled silage and of dry matter per cubic foot for slightly dented to well-dented corn in the Beltsville silos, compared with Eckles' data*

| Depth of settled silage (feet) | Weight per cubic foot at the depth indicated | | | Average weight per cubic foot for all silage above the depth indicated | | |
|---|---|---|---|---|---|---|
| | Beltsville data[1] | | Eckles' data[2] | Beltsville data[1] | | Eckles' data[2] |
| | Corn silage | Dry matter | Corn silage | Corn silage | Dry matter | Corn silage |
| | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* | *Pounds* |
| 1 | 17.7 | 4.89 | 32.0 | 17.7 | 4.89 | 32.0 |
| 2 | 29.2 | 8.07 | 32.7 | 23.5 | 6.49 | 32.4 |
| 3 | 33.9 | 9.37 | 33.4 | 26.9 | 7.43 | 32.7 |
| 4 | 37.2 | 10.28 | 34.1 | 29.5 | 8.15 | 33.1 |
| 5 | 39.8 | 11.00 | 34.8 | 31.6 | 8.73 | 33.4 |
| 6 | 41.8 | 11.55 | 35.4 | 33.3 | 9.20 | 33.7 |
| 7 | 43.6 | 12.05 | 36.0 | 34.7 | 9.59 | 34.1 |
| 8 | 45.0 | 12.43 | 36.6 | 36.0 | 9.95 | 34.4 |
| 9 | 46.1 | 12.74 | 37.4 | 37.1 | 10.25 | 34.7 |
| 10 | 47.1 | 13.01 | 38.0 | 38.1 | 10.53 | 35.0 |
| 11 | 47.9 | 13.23 | 38.4 | 39.0 | 10.78 | 35.3 |
| 12 | 48.7 | 13.46 | 38.8 | 39.8 | 11.00 | 35.6 |
| 13 | 49.3 | 13.62 | 39.2 | 40.6 | 11.22 | 35.9 |
| 14 | 49.9 | 13.79 | 39.6 | 41.2 | 11.38 | 36.2 |
| 15 | 50.5 | 13.95 | 40.0 | 41.8 | 11.55 | 36.4 |
| 16 | 51.0 | 14.09 | 40.2 | 42.4 | 11.72 | 36.7 |
| 17 | 51.4 | 14.20 | 40.4 | 43.0 | 11.88 | 36.9 |
| 18 | 51.8 | 14.31 | 40.6 | 43.5 | 12.02 | 37.1 |
| 19 | 52.1 | 14.40 | 40.8 | 43.9 | 12.13 | 37.3 |
| 20 | 52.4 | 14.48 | 41.0 | 44.3 | 12.24 | 37.5 |
| 21 | 52.7 | 14.56 | 41.2 | 44.7 | 12.35 | 37.6 |
| 22 | 53.0 | 14.64 | 41.4 | 45.1 | 12.46 | 37.8 |
| 23 | 53.3 | 14.73 | 41.6 | 45.5 | 12.57 | 38.0 |
| 24 | 53.5 | 14.78 | 41.8 | 45.8 | 12.65 | 38.1 |
| 25 | 53.7 | 14.84 | 42.0 | 46.1 | 12.74 | 38.3 |
| 26 | 53.9 | 14.89 | 42.2 | 46.4 | 12.82 | 38.4 |
| 27 | 54.1 | 14.95 | 42.4 | 46.7 | 12.90 | 38.6 |
| 28 | 54.2 | 14.98 | 42.6 | 46.9 | 12.96 | 38.7 |
| 29 | 54.3 | 15.00 | 42.8 | 47.2 | 13.04 | 38.9 |
| 30 | 54.4 | 15.03 | 43.0 | 47.4 | 13.10 | 39.0 |
| 31 | 54.5 | 15.06 | ---------- | 47.7 | 13.18 | ---------- |
| 32 | 54.6 | 15.09 | ---------- | 47.9 | 13.23 | ---------- |
| 33 | 54.7 | 15.11 | ---------- | 48.1 | 13.29 | ---------- |
| 34 | 54.7 | 15.13 | ---------- | 48.3 | 13.35 | ---------- |
| 35 | 54.8 | 15.14 | ---------- | 48.5 | 13.40 | ---------- |

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[1] Based on the average for silos 1, 3, 5, and 6 that contained corn silage with an average dry-matter content of 27.63 percent.

[2] See text footnote 3, p. 2.

The Eckles data include silage ranging from 24 to 43 percent of dry matter per silo, and a majority of the silos contained silage that was drier than average silage. However, among the Eckles silos were five with 25 feet or less of settled silage containing 25 to 30 percent of dry matter per silo, and one containing immature corn with 24 percent of dry matter. Tabulated separately, it was found that these six silos contained silage that weighed about as much per cubic foot as Beltsville silage at the same depth. These weights are indicated in figure 3 by crosses.

An examination of Eckles' silos individually and a comparison of these with his average, indicates that his average is best suited for silage containing 34 to 36 percent of dry matter made from fully dented and mature corn.

# ESTIMATING THE SETTLED-SILAGE CONTENT OF SILOS

Table 5, which can be used to estimate the settled-silage content of silos, was prepared from the Beltsville data obtained by actually weighing all the silage as it was fed out of four silos. The average dry-matter content of the silage in the four silos was 27.63 percent, or only slightly below Morrison's average (28.3 percent) for silage made from well-matured dent corn.

**Table 5.**—*Average weight per cubic foot and the total quantity of settled silage from the top to various depths* [1]

| Depth of settled silage (feet) | Average weight per cubic foot [2] | | Total quantity of settled silage, from the top to the depth indicated, in silos having a diameter of— | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Silage | Dry matter | 10 feet | 12 feet | 14 feet | 16 feet | 18 feet | 20 feet |
| | *Pounds* | *Pounds* | *Tons* | *Tons* | *Tons* | *Tons* | *Tons* | *Tons* |
| 1 | 17.7 | 4.89 | 0.7 | 1.0 | 1.4 | 1.8 | 2.2 | 2.8 |
| 2 | 23.5 | 6.49 | 1.8 | 2.6 | 3.6 | 4.7 | 6.0 | 7.4 |
| 3 | 26.9 | 7.43 | 3.2 | 4.6 | 6.2 | 8.1 | 10.3 | 12.7 |
| 4 | 29.5 | 8.15 | 4.7 | 6.7 | 9.1 | 11.9 | 15.0 | 18.5 |
| 5 | 31.6 | 8.73 | 6.3 | 8.9 | 12.1 | 15.9 | 20.1 | 24.8 |
| 6 | 33.3 | 9.20 | 7.9 | 11.3 | 15.4 | 20.1 | 25.5 | 31.4 |
| 7 | 34.7 | 9.59 | 9.6 | 13.8 | 18.7 | 24.4 | 31.0 | 38.3 |
| 8 | 36.0 | 9.95 | 11.4 | 16.3 | 22.2 | 29.0 | 36.7 | 45.3 |
| 9 | 37.1 | 10.25 | 13.2 | 18.9 | 25.7 | 33.6 | 42.6 | 52.5 |
| 10 | 38.1 | 10.53 | 15.0 | 21.6 | 29.4 | 38.3 | 48.6 | 59.9 |
| 11 | 39.0 | 10.78 | 16.9 | 24.3 | 33.0 | 43.1 | 54.7 | 67.4 |
| 12 | 39.8 | 11.00 | 18.8 | 27.0 | 36.8 | 48.0 | 60.9 | 75.1 |
| 13 | 40.6 | 11.22 | 20.8 | 29.8 | 40.6 | 53.0 | 67.2 | 82.8 |
| 14 | 41.2 | 11.38 | 22.7 | 32.6 | 44.4 | 58.0 | 73.5 | 90.7 |
| 15 | 41.8 | 11.55 | 24.7 | 35.5 | 48.3 | 63.1 | 79.9 | 98.6 |
| 16 | 42.4 | 11.72 | 26.7 | 38.4 | 52.2 | 68.2 | 86.4 | 106.6 |
| 17 | 43.0 | 11.88 | 28.7 | 41.3 | 56.2 | 73.4 | 93.0 | 114.7 |
| 18 | 43.5 | 12.02 | 30.8 | 44.2 | 60.2 | 78.6 | 99.6 | 122.8 |
| 19 | 43.9 | 12.13 | 32.8 | 47.2 | 64.2 | 83.8 | 106.2 | 131.0 |
| 20 | 44.3 | 12.24 | 34.9 | 50.1 | 68.2 | 89.1 | 112.8 | 139.2 |
| 21 | 44.7 | 12.35 | 36.9 | 53.1 | 72.3 | 94.4 | 119.6 | 147.5 |
| 22 | 45.1 | 12.46 | 39.0 | 56.1 | 76.4 | 99.8 | 126.3 | 155.8 |
| 23 | 45.5 | 12.57 | 41.1 | 59.1 | 80.5 | 105.1 | 133.1 | 164.2 |
| 24 | 45.8 | 12.65 | 43.2 | 62.1 | 84.6 | 110.5 | 139.9 | 172.6 |
| 25 | 46.1 | 12.74 | 45.3 | 65.2 | 88.7 | 115.9 | 146.7 | 181.0 |
| 26 | 46.4 | 12.82 | 47.4 | 68.2 | 92.9 | 121.3 | 153.6 | 189.5 |
| 27 | 46.7 | 12.90 | 49.6 | 71.3 | 97.0 | 126.8 | 160.5 | 198.0 |
| 28 | 46.9 | 12.96 | 51.7 | 74.4 | 101.2 | 132.2 | 167.4 | 206.5 |
| 29 | 47.2 | 13.04 | 53.8 | 77.4 | 105.4 | 137.7 | 174.3 | 215.1 |
| 30 | 47.4 | 13.10 | 56.0 | 80.5 | 109.6 | 143.1 | 181.2 | 223.6 |
| 31 | 47.7 | 13.18 | 58.1 | 83.6 | 113.8 | 148.6 | 188.1 | 232.2 |
| 32 | 47.9 | 13.23 | 60.2 | 86.7 | 118.0 | 154.1 | 195.1 | 240.8 |
| 33 | 48.1 | 13.29 | 62.4 | 89.8 | 122.2 | 159.6 | 202.0 | 249.3 |
| 34 | 48.3 | 13.35 | 64.5 | 92.8 | 126.4 | 165.1 | 209.0 | 257.9 |
| 35 | 48.5 | 13.40 | 66.7 | 96.0 | 130.6 | 170.6 | 216.0 | 266.6 |
| 36 | | | | | 134.8 | 176.1 | 222.9 | 275.2 |
| 37 | | | | | 139.0 | 181.6 | 229.9 | 283.8 |
| 38 | | | | | 143.3 | 187.1 | 236.9 | 292.4 |
| 39 | | | | | 147.5 | 192.6 | 243.8 | 301.0 |
| 40 | | | | | 151.7 | 198.2 | 250.8 | 309.6 |
| 41 | | | | | | 203.7 | 257.8 | 318.2 |
| 42 | | | | | | 209.2 | 264.8 | 326.8 |
| 43 | | | | | | 214.7 | 271.7 | 335.4 |
| 44 | | | | | | 220.2 | 278.7 | 344.0 |
| 45 | | | | | | 225.7 | 285.7 | 352.6 |
| 46 | | | | | | | 292.6 | 361.3 |
| 47 | | | | | | | 299.6 | 369.9 |
| 48 | | | | | | | 306.6 | 378.5 |
| 49 | | | | | | | 313.5 | 387.1 |
| 50 | | | | | | | 320.5 | 395.7 |

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[1] Based on the data for 4 Beltsville silos in which the silage contained 27.63 percent of dry matter

[2] The average weight per cubic foot for all silage above the depth indicated.

This table gives the average weight of silage and of dry matter per cubic foot and the total weight of settled silage to different depths in silos of different diameters. The quantities of silage stated should not be misinterpreted as silo capacities, since one should count on silage settling about 15 percent. In other words, if a 40-foot silo is filled to the top, the silage will settle to about 34 feet. Therefore, a 40-foot silo 14 feet in diameter will contain 126.4 tons of settled silage, and not 151.7 tons.

In order to determine the amount of silage remaining in a silo that has been partly emptied, one should first determine the point to which the silage settled after filling and from that point measure the depth of settled silage that was removed. With this measurement available one can read directly from the table the quantity of silage that was fed out or removed. The difference between the quantity removed and the total quantity that was in the silo represents the quantity left in the silo. For example, if the silo is 12 feet in diameter and contains 30 feet of settled silage, the tonnage is 80.5. Now if silage is removed to a depth of 15 feet, the quantity removed would be 35.5 tons, including any spoiled silage on top, and there would be left in the silo the difference between 80.5 and 35.5 tons, or 45 tons.

The Beltsville data indicate that the table of silage weights can be used without change for silage made from well-eared corn that was finely chopped when put in the silo, if it was cut when slightly dented to well dented and before it is fully dented and hard. Cut at this stage, silage will normally contain 70 to 74 percent of moisture, or 30 to 26 percent of dry matter.

For corn silage differing from the above, the Beltsville data indicate that the following corrections should be used:

1. If the corn is well eared but immature, add 5 percent to the figures in the table. If it has only a fair number of ears, deduct 5 percent, and if it has few ears or none, deduct 10 percent.
2. If the corn contains 31 to 33 percent of dry matter (almost fully dented), deduct 5 to 10 percent.
3. If the corn contains 34 to 36 percent of dry matter (fully dented and hard), deduct 15 to 20 percent.
4. If the corn is cut in ⅝- to ¾-inch lengths or longer, deduct 5 percent.

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